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UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner: Group: Attorney Docket # 1932

Applicant(s) : BURGER, K., ET AL

Serial No. :

Filed

For : METHOD AND APPARATUS FOR COATING AT LEAST ONE WIPER BLADE ELEMENT

SIMULTANEOUS AMENDMENT

January 18, 2002

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

SIRS:

Simultaneously with filing of the above identified application
please amend the same as follows:

In the Claims:

Cancel all claims without prejudice

Substitute the claims attached hereto

application.

their multiple dependency.

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Consideration and allowance of the present application is most respectfully requested.

Respectfully submitted,


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Claims

1. A method for coating at least one wiper blade element (10) made of an elastomer material, in which first, the surface of the wiper blade element (10) is cleaned and activated by means of a plasma, and then in a CVD process, a coating material is brought into a plasma state and at least one protective coating (64) forms on the surface of the wiper blade element (10), where a high-frequency voltage is applied to the region of the wiper blade element (10) oriented away from the protective layer (64) by means of an electrode (56), characterized in that before being brought into a treatment chamber (32, 34, 36, 38, 40, 74), the wiper blade element (10) is cut to a useful length (66) from a profiled band, is placed on an electrode plate (56) of a merchandise carrier (42), and is subjected to a plasma flow (50).
2. The method according to claim 1, characterized in that the treatment steps are executed in a single-chamber or multiple-chamber batch process, with cycle times between 10 seconds and a few minutes.
3. The method according to claim 2, characterized in that the cycle times are between 30 seconds and one minute.
4. The method according to [one of the preceding claims] claim 1, characterized in that the pretreatment takes place at a pressure of approximately 0.1 to 100 mbar.
5. The method according to [one of the preceding claims] claim 1, characterized in that a thin bonding agent layer is applied to the wiper blade element (10).
6. The method according to [one of the preceding claims] claim 1, characterized in that the coating material, which is activated by means of a plasma, is comprised of low-molecular, cross-linkable, gaseous materials, halogen-containing, silicon-containing, carbon-containing, or metal-organic monomers.

7. The method according to claim 6, characterized in that the alternating current that is applied to the electrode plate (56) has a frequency of ten kHz to a few MHz, preferably 13.56 MHz, and the power to be coupled-in has approximately one to a hundred Watts per cm² of electrode surface area.

8. The method according to [one of the preceding claims] claim 1, characterized in that the wiper blade element (10) rests with one side of the wiper lip (18) against an electrode plate (76).

9. The method according to claim 8, characterized in that two wiper blade elements (10) rest on the electrode plate (76), with wiper lips (18) oriented toward each other.

10. The method according to claim 9, characterized in that two wiper blade elements (10), with wiper lips (18) oriented toward each other, are connected at the wiper lips by means of an intermediary piece (78) and are separated after the coating is applied.

11. The method according to [one of claims 1 to 7] claim 1, characterized in that the wiper lip (18) of the wiper blade element (10) stands approximately perpendicular to the electrode plate (56), which extends on both sides of the wiper blade element (10).

12. The method according to claim 11, characterized in that the electrode plate (56) engages laterally in longitudinal grooves (22, 26) of the wiper blade element (10).

13. The method according to [one of the preceding claims] claim 1, characterized in that the treatment steps are executed sequentially in different treatment chambers (32, 34, 36, 38, 40).

14. A device for executing the method according to [one of the preceding claims] claim 1, characterized in that the treatment chambers (32, 34, 36, 38, 40) have gas

nozzles (52) whose openings are oriented toward the wiper lips (18) of the inserted wiper blade elements (10).

15. The device according to claim 14, characterized in that one or more gas nozzles (52) are associated with one or more wiper blade elements (10).

16. The device according to claim 14 [or 15], characterized in that gas slots (58) are disposed at the longitudinal sides of the wiper blade element (10), lateral to the electrode plates (56, 76), and gas is aspirated through these slots by a gas pump (62).

17. The device according to [one of claims 14 to 16] claim 14, characterized in that gas baffles (54) are disposed in the treatment chambers (34, 36, 38, 40, 74).

18. The device according to [one of claims 14 to 17] claim 14, characterized in that the electrode plate (56, 76) is at least partially covered with insulating material (70).

19. The device according to [one of claims 14 to 18] claim 14, characterized in that the electrode plate (56, 76) is equipped to receive one or more wiper blade elements (10).

20. The device according to [one of claims 14 to 19] claim 14, characterized in that a number of treatment chambers (32, 34) are arranged in a line.

21. The device according to [one of claims 14 to 19] claim 14, characterized in that a number of treatment chambers (36, 38, 40) are arranged in a closed configuration.

22. The device according to [one of claims 14 to 21] claim 14, characterized in that the wiper blade elements (10) and the electrode plates (56) are disposed on a merchandise carrier (42), which is fastened to a transport mechanism (46) for conveying the wiper blade elements (10) from one treatment chamber (36, 38, 40, 74) to the others.

23. The device according to claim 22, characterized in that at least one treatment chamber (32, 34) is also used for the loading and/or unloading of merchandise carriers (42).

Claims

1. A method for coating at least one wiper blade element (10) made of an elastomer material, in which first, the surface of the wiper blade element (10) is cleaned and activated by means of a plasma, and then in a CVD process, a coating material is brought into a plasma state and at least one protective coating (64) forms on the surface of the wiper blade element (10), where a high-frequency voltage is applied to the region of the wiper blade element (10) oriented away from the protective layer (64) by means of an electrode (56), characterized in that before being brought into a treatment chamber (32, 34, 36, 38, 40, 74), the wiper blade element (10) is cut to a useful length (66) from a profiled band, is placed on an electrode plate (56) of a merchandise carrier (42), and is subjected to a plasma flow (50).
2. The method according to claim 1, characterized in that the treatment steps are executed in a single-chamber or multiple-chamber batch process, with cycle times between 10 seconds and a few minutes.
3. The method according to claim 2, characterized in that the cycle times are between 30 seconds and one minute.
4. The method according to claim 1, characterized in that the pretreatment takes place at a pressure of approximately 0.1 to 100 mbar.
5. The method according to claim 1, characterized in that a thin bonding agent layer is applied to the wiper blade element (10).
6. The method according to claim 1, characterized in that the coating material, which is activated by means of a plasma, is comprised of low-molecular, cross-linkable, gaseous materials, halogen-containing, silicon-containing, carbon-containing, or metal-organic monomers.

7. The method according to claim 6, characterized in that the alternating current that is applied to the electrode plate (56) has a frequency of ten kHz to a few MHz, preferably 13.56 MHz, and the power to be coupled-in has approximately one to a hundred Watts per cm^2 of electrode surface area.

8. The method according to claim 1, characterized in that the wiper blade element (10) rests with one side of the wiper lip (18) against an electrode plate (76).

9. The method according to claim 8, characterized in that two wiper blade elements (10) rest on the electrode plate (76), with wiper lips (18) oriented toward each other.

10. The method according to claim 9, characterized in that two wiper blade elements (10), with wiper lips (18) oriented toward each other, are connected at the wiper lips by means of an intermediary piece (78) and are separated after the coating is applied.

11. The method according to claim 1, characterized in that the wiper lip (18) of the wiper blade element (10) stands approximately perpendicular to the electrode plate (56), which extends on both sides of the wiper blade element (10).

12. The method according to claim 11, characterized in that the electrode plate (56) engages laterally in longitudinal grooves (22, 26) of the wiper blade element (10).

13. The method according to claim 1, characterized in that the treatment steps are executed sequentially in different treatment chambers (32, 34, 36, 38, 40).

14. A device for executing the method according to claim 1, characterized in that the treatment chambers (32, 34, 36, 38, 40) have gas nozzles (52) whose openings are oriented toward the wiper lips (18) of the inserted wiper blade elements (10).

15. The device according to claim 14, characterized in that one or more gas nozzles (52) are associated with one or more wiper blade elements (10).

16. The device according to claim 14, characterized in that gas slots (58) are disposed at the longitudinal sides of the wiper blade element (10), lateral to the electrode plates (56, 76), and gas is aspirated through these slots by a gas pump (62).

17. The device according to claim 14, characterized in that gas baffles (54) are disposed in the treatment chambers (34, 36, 38, 40, 74).

18. The device according to claim 14, characterized in that the electrode plate (56, 76) is at least partially covered with insulating material (70).

19. The device according to claim 14, characterized in that the electrode plate (56, 76) is equipped to receive one or more wiper blade elements (10).

20. The device according to claim 14, characterized in that a number of treatment chambers (32, 34) are arranged in a line.

21. The device according to claim 14, characterized in that a number of treatment chambers (36, 38, 40) are arranged in a closed configuration.

22. The device according to claim 14, characterized in that the wiper blade elements (10) and the electrode plates (56) are disposed on a merchandise carrier (42), which is fastened to a transport mechanism (46) for conveying the wiper blade elements (10) from one treatment chamber (36, 38, 40, 74) to the others.

23. The device according to claim 22, characterized in that at least one treatment chamber (32, 34) is also used for the loading and/or unloading of merchandise carriers (42).